

Botany report for  
**Concow Pyrodiversity Project**  
(Short form Biological Evaluation/ Biological Assessment/ Noxious Weed Risk Assessment)

Prepared by Wolfy Rougle, Butte County Resource Conservation District,  
for  
Feather River Ranger District  
Final revised as of 9/30/2021.

My assessments, below, are based on Feather River RD GIS layers and other available records for survey areas, surveys conducted in spring-summer 2021 by BCRCD personnel (051103\_2021\_009; forms/maps/updates to PNF GIS layers are attached with this report), consultation with retired and former Forest Service botanists and other botanists, herbarium visits, known (e.g., CNDDDB) occurrences of species of conservation concern (rare plants: USFWS Threatened or Endangered, FS Sensitive, PNF Watch List, and CRPR-ranked plants), and infestations of non-native invasive plants (NNIP).

## **PROJECT DETERMINATION SUMMARY**

*Survey summary: COMPLETE.*

*Species of conservation concern (rare plants) summary:*

- *There are no concerns for species of conservation concern with implementation of the Management Requirements during project implementation (see Appendix A).*

*Non-native invasive plants (NNIP) summary:*

- *Concerns about NNIP in the project area are being addressed as part of project design with an integrated pest management program that meets the purpose and need for the project (see Appendix A).*

## **PROJECT DESCRIPTION**

### **PROPOSED PROJECT ACTION AND DESCRIPTION.**

This project (PALS #59322) has been developed in cooperation with the USDA Forest Service and CAL FIRE, who each desire to use prescribed burning as a restoration and maintenance tool to enhance ecologic and economic viability of the lands under their stewardship. This is a cross-boundary initiative to apply prescribed fire on a total of 3,280 acres of combined State and Federal Responsibility Areas. Phases 1, 2 and 3 each include portions of Federal land (see attached Cross-boundary Project Map). For the purposes of this project description, solely Federal lands are mentioned.

The project is located in what was formerly a mixed-coniferous forest vegetation type, and is now primarily a *Ceanothus integerrimus-Quercus kelloggii* alliance brushland vegetation type, within the Concow area north of the Concow Reservoir, in the Feather River drainage (T23N R4E, sections 26 and 36; and T23N R5E, sections 19, 29, 30, 31, and 32). This landscape has been impacted by two high severity fires over the last 13 years, the BTU Lightning Fire in 2008 and the Camp Fire in 2018.

Project actions consist of prescribed fire and associated actions including the creation of fuel breaks, handlines, thinning of brush and trees, yarding, piling and pile-burning, mastication near roads, and road maintenance and improvements (existing system roads only). The prescribed fire treatment units

proposed are several hundred acres in size, with burning events anticipated to be performed every three-to-ten-years (based on ecological monitoring results) with the intention of approaching traditional cultural fire return intervals. Mastication and grazing could be utilized to prepare the site for prescribed fire implementation. Prescribed burning activities would consist of ground ignitions around perimeter locations and/or aerial ignitions where fire is applied to the majority or all of an area within the designated boundaries for reduction of fuel hazard or low intensity fire for consuming surface fuels, but not the overstory canopy. In general, shrubs and understory plants would be either consumed or scorched. However, a survey of the serpentine areas after the Camp Fire suggests that on serpentine areas, fire might not scorch or consume shrubbery; indeed, fire might not even carry on the serpentine belt(s).

## **SURVEYS**

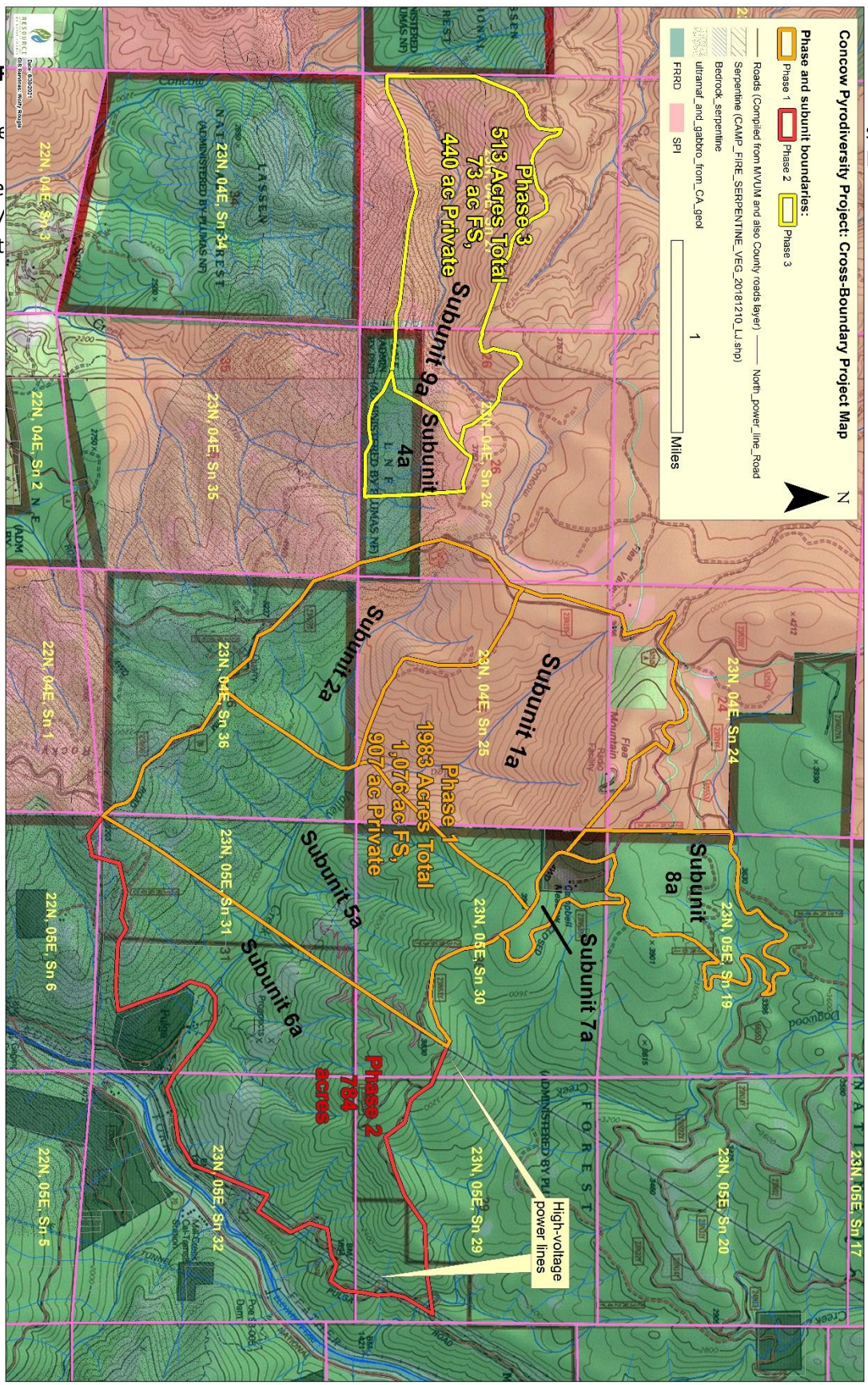
The project area has been surveyed for plant species of conservation concern (USFWS T&E, FS Sensitive, and PNF Watch List) and non-native invasive plants (NNIP), some areas more than once, by various Forest Service botanists and by BCRC D botanists between 2005 and 2021. Some surveys were conducted as part of project planning for earlier projects, but most of the area received its first survey in 2021:

- 051103\_2005\_002 -- in 2005 for Flea DFPZ (part of T23N R04E section 36)
- 051103\_2005\_006 -- in 2005 for Flea DFPZ (parts of T23N R05E sections 29, 30, 31, 32 and part of T23N R04E section 36)
- 051103\_2005\_007 -- in 2005 for Flea DFPZ (parts of T23N R05E section 19)
- 051103\_2006\_008 -- in 2006 for Flea DFPZ (part of T23N R04E section 36)
- 051103\_2006\_012 -- in 2006 for Flea DFPZ (parts of T23N R05E section 30)
- 051103\_2020\_001 (BCRC D surveys) - In 2020 for Concow Resilience Project (part of of T23N R04E section 36)
- There are also some TES records in parts of T23N R05E section 31, but no recorded survey.
- 051103\_2021\_009 -- in 2021 for this project, Concow Pyrodiversity Project (parts of all sections, i.e., T23N R4E, sections 26 and 36; and T23N R5E, sections 19, 29, 30, 31, and 32).

*Survey summary: COMPLETE.*



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**SPECIES OF**

Four species are known project area and M implement

### **SPECIES OF CONSERVATION CONCERN (SENSITIVE FUNGI)**

A potential habitat model was used to help determine project effects to *Phaeocollybia olivacea* (PHOL) and/or *Dendrocollybia racemosa* (DERA5), two R5 Sensitive fungal species. This model was developed in 2006 by Ron O'Hanlon of Vegetation Management Solutions (Hoover & O'Hanlon 2008) to aid in the identification of potential habitat for selected R5 Sensitive fungi. The model is based on the professional experience of Dr. Dennis E. Desjardin (Professor of Mycology at San Francisco State University), Dr. David Largent (retired Professor of Mycology at Humboldt State University), and other mycologists, and their understanding of fungal biology. The two main variables that were shown to correspond with known population locations are tree canopy cover and tree species, especially with the presence of Douglas-fir and a well-defined hardwood component. The model delineates habitat quality into low, medium, and high quality potential habitat. Only high quality potential habitat is assessed for impacts to these species on the Plumas National Forest.

Surveys were not conducted for PHOL or DERA5 because these fall-fruiting species may not produce visible mushrooms every year even if the fungus exists below ground. Consequently, areas of potential habitat that rank as having a high potential are assumed to be occupied for the purposes of this analysis. Thus, for the purposes of this discussion low and medium quality habitat is not addressed.

**DERA5:** There is no high quality potential habitat for DERA5 present in the Concow Pyrodiversity Project area. There are approximately 562 acres of medium quality potential habitat within the project area. There is no further discussion of this species in this document. There are no known occurrences in the project area.

**PHOL:** There are approximately 562 acres of high quality potential habitat for PHOL present in the Concow Pyrodiversity Project area. There are approximately 676 acres of medium quality potential habitat within the project area (see map next page). This species is discussed below.



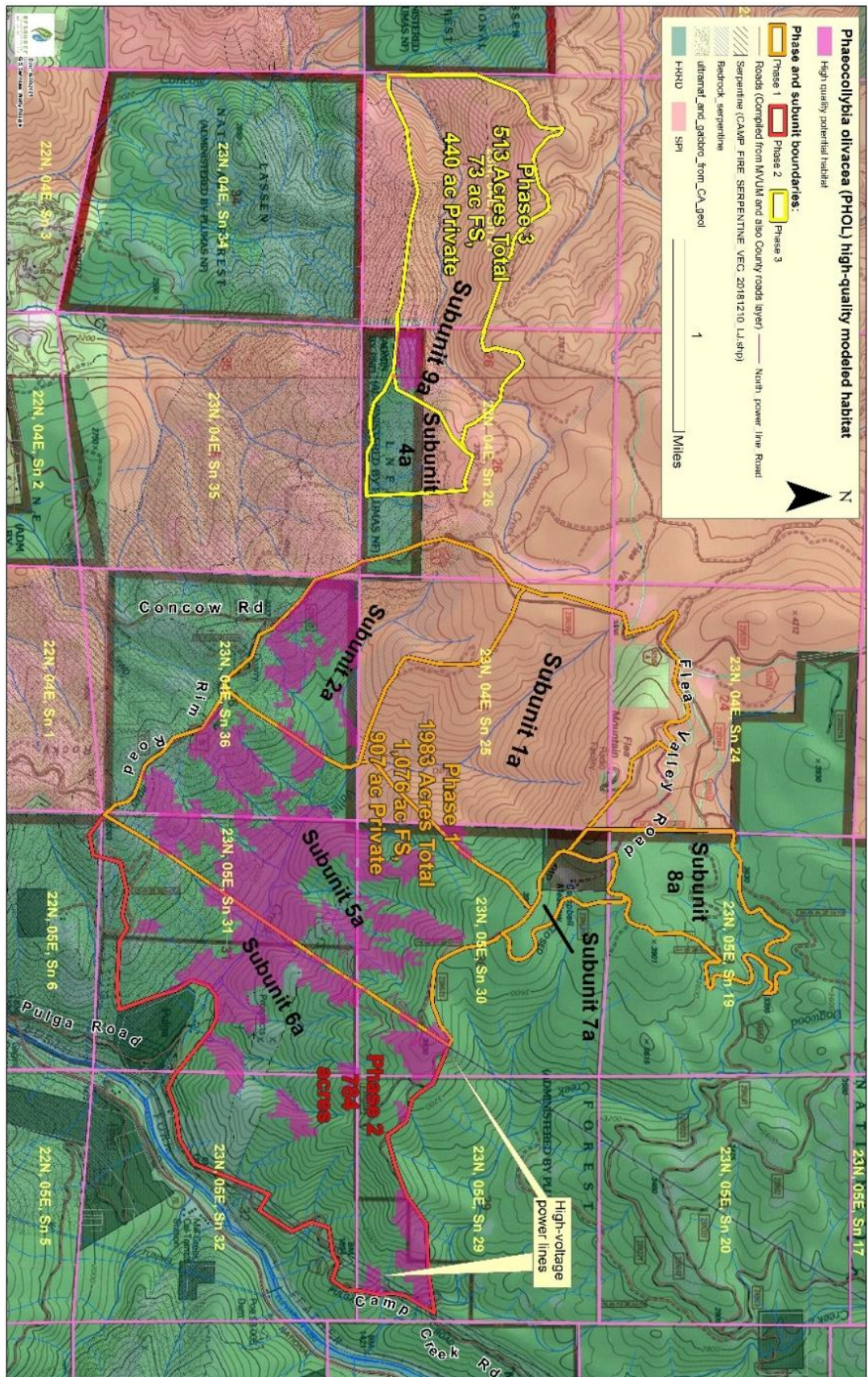


Table 1. Forest Service Sensitive and Plumas NF Watch List plant species found within the project area.

Scientific name	Common name	Management category <sup>1</sup>	Acres within project	Percent acres protected <sup>3</sup>	Project design features <sup>2</sup>
<i>Allium jepsonii</i>	Jepson's onion	Sensitive	1.23	100%	Botany Controlled Areas
<i>Anomobryum julaceum</i>	Slender silver moss	Watch List	0.019	...	Fire or other fuels management activities would be unlikely to impact this occurrence based on its mapped location (protected by rock cliffs from any activities in unit)
<i>Clarkia mildrediae</i> ssp. <i>lutescens</i>	Golden-anthered clarkia	Watch List	2.54 ac mapped; occurrence is likely more extensive	0%	Fall burning (recommended) will protect all individuals. If spring burning is necessary, individuals may be harmed but net effects of project beneficial due to species' habitat needs/ life cycle
<i>Clarkia mildrediae</i> ssp. <i>mildrediae</i>	Mildred's clarkia	Sensitive	4.62	0%	Fall burning (recommended) will protect all individuals. If spring burning is necessary, individuals may be harmed but net effects of project beneficial due to species' habitat needs/ life cycle
<i>Erigeron petrophilus</i> var. <i>sierrensis</i>	Northern Sierra daisy	Watch List	20.36	90%	Botany Controlled Areas
<i>Eriogonum umbellatum</i> var. <i>ahartii</i>	Ahart's buck-wheat	Sensitive	5.90	100%	Botany Controlled Areas
<i>Packera eurycephala</i> var. <i>lewisrosei</i>	Lewis Rose's ragwort	Sensitive	52.04	80%	Botany Controlled Areas
<i>Phaeocollybia olivacea</i>	Olive phaeocollybia	Sensitive	562 (modeled)	98.3%	Project is not ground-disturbing in 98.3% of modeled high-quality habitat

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<i>Clarkia mildrediae</i> ssp. <i>mildrediae</i>	Mildred's clarkia	Sensitive	4.62	0%	Fall burning (recommended) will protect all individuals. If spring burning is necessary, individuals may be harmed but net effects of project beneficial due to species' habitat needs/ life cycle
<i>Sambucus</i>	Elderberry	Not rare, but potential habitat for rare wildlife (VELB)	Common	Wildlife Biologist will determine	Recommend crew training; See Wildlife BE
<i>Streptanthus longisiliquus</i>	Long-fruit jewel-flower	Watch List	0.68	100%	Botany Controlled Areas

<sup>1</sup>In general Forest Service Sensitive species have stricter management requirements due to their greater level of rarity and their designation as Sensitive by the Regional Forester (USDA Forest Service 2013), compared to Watch List species which are designated by the Plumas NF Forest Supervisor (USDA Forest Service 2014) below for details of these protocols.

<sup>3</sup>See the discussions below about factors that result in actual protection of a greater percent of these plants or why this percentage is adequate.

- **Jepson's onion** (*Allium jepsonii*; **ALJE** – FS Sensitive species).
  - This bulbiferous perennial is known from two occurrences along the Rim Rd boundary of Phase 1 (subunit 5a) in section 36, totaling about 1.23 acres. This is part of a much larger occurrence that totals about 14.71 acres. Habitat for this species is always in serpentine openings with only minimal tree canopy, often also in openings with an open shrub layer dominated by white-leaf manzanita (*Arctostaphylos viscida* and/or *Arctostaphylos mewukka*).
  - This species is generally only visible from June to August, although definitive identification to species is only possible in July. The species is dormant and not vulnerable to impacts from grazing, manual fuels reduction treatment, or fire from September through May.
  - PNF Management Prescription for this species (USDA Forest Service 2014) says to:
 

*Protect all plant occurrences from ground disturbance. Hand thin and lop and scatter around known occurrences if fuel treatment prior to burning is needed. Avoid scattering slash on plants. Investigate the use of prescribed fire as a management tool and monitor effects. To the extent possible, avoid ignitions within occurrences and avoid building fire control lines in or near occurrences. Also, allow fire to creep/back into occurrences from adjacent terrain if the fuel loading permits. Evaluate other activities on a site-by-site basis considering species abundance, population size, geographic distribution, and known species ecology.*
  - MANAGEMENT REQUIREMENTS for Jepson's onion. It's not practical to flag occurrences of this species because there are few woody plants to hang plants on and the ground is hard rock that won't accept pin flags. Therefore, to avoid disturbance to the species, exclude roadside mapped serpentine areas (open, savannahlike areas) below Rim Rd from mastication or other mechanical treatments (lop and scatter by hand OK). No manual ignitions in serpentine area (train crews to visually identify serpentine areas) – this requirement is probably unnecessary because fuels are naturally so sparse in serpentine, it's unlikely crews would try to ignite there. Do not graze the serpentine (open reddish area) below Rim Rd. See Appendix A for details.
  - **FS Sensitive plant species – project activities will not affect:** With management requirements incorporated, 100% of plants will be protected.
- **Slender silver moss** (*Anomobryum julaceum*; **ANJU4** – PNF Watch List species).
  - Slender silver moss is known from one minute occurrence along the eastern edge of phase 2 (subunit 6a) in T23N R05E sn 32 (<0.1 acres total). Habitat for this species is generally in crevices on earth or rock cliffs, on granitic outcrops, and on tundra tussocks.
  - This species can be recognized in the wet season by experienced bryophyte experts.
  - PNF Management Prescription for this species (USDA Forest Service 2014) says to:
 

*Protect all plant locations from ground disturbance. Maintain hydrological conditions in seeping cliff habitat with this moss species. Evaluate road maintenance activities to avoid known occurrences.*
  - MANAGEMENT REQUIREMENTS for slender silver moss. None. The occurrence was not relocated by botanists in 2021. Based on mapping, however, this occurrence appears to be mapped on (or perhaps at the base of?) a vertical granite cliff arising directly from a road which is a project boundary/fireline. Since there is no burnable fuel between the project boundary and the occurrence, it is not likely to be affected by prescribed fire (or any other fuels management) activities. See Appendix A for details.
- **Golden-anthered clarkia** (*Clarkia mildrediae* ssp. *lutescens* CLMIL3 – PNF Watch List species).
  - Golden-anthered clarkia is known from 9 occurrences or sub-occurrences in the project area. Most are scattered across the slopes of phases 1 and 2, but one is in and adjacent to a rocky



- ephemeral drainage that has been chosen to form the southern boundary of Phase 1 in T23N R05E sn 31. Habitat for this subspecies is in forest and woodland openings in the Feather River drainage, usually on granitic soils but occasionally on soils with an ultramafic influence. The subspecies is known to benefit from soil disturbance.
- This taxon can be identified to species from mid-May to mid-June (sometimes later in wet years) but can only be identified to subspecies when the corolla is visible and fresh, i.e. early to mid June.
  - PNF Management Prescription for this species (USDA Forest Service 2014) says to:  
*Evaluate all project activities on a site-by-site basis considering species abundance, population size, geographic distribution, and known species ecology. Focus on protecting plants in natural openings from ground disturbance, although light ground disturbance outside of the growing season may be acceptable. Canopy removal and prescribed fire in and adjacent to occurrences is encouraged to open the habitat and to maintain suitable habitat.*
  - MANAGEMENT REQUIREMENTS for golden-anthered clarkia. This Watch List species is an annual with a durable long-term seed bank and a habitat need for open spaces. Therefore, if a treatment results in greater openings for *Clarkia* habitat **and** this habitat improvement is likely to persist for several full growing seasons or more, then the benefits of the treatment are likely to outweigh the disadvantage even if the treatment also kills individuals or even destroys an entire single year's generation of plants. While ***it is encouraged to implement burns and grazing only from September through February***, burning or grazing outside this season is still better than not burning at all. Do not graze or burn the same area several springs in a row. Otherwise, no management requirements. See Appendix A for details.
  - **Mildred's clarkia** (*Clarkia mildrediae* ssp. *mildrediae*; **CLMIM** – FS Sensitive species).
    - Mildred's clarkia is known from two occurrences close together on the eastern boundary of Phase 2 (subunit 6a). The occurrences are located along Camp Creek Rd which is a project boundary/fireline. Habitat for this species is usually in disturbed, sunny granitic areas, so it often benefits from road disturbance.
    - This taxon can be identified to species from mid-May to mid-June (sometimes later in wet years) but can only be identified to subspecies when the corolla is visible and fresh, i.e., early to mid-June.
    - PNF Management Prescription for this species (USDA Forest Service 2014) says to:  
*Protect occurrences from ground disturbance before seedset. Evaluate ground disturbance outside the growing season; however, in general, disturbance (without major habitat alteration) after plants had set seed could occur. Canopy removal in and adjacent to occurrences is encouraged to open the habitat. Investigate the use of prescribed fire as a management tool and monitor effects. To the extent possible, avoid ignitions within occurrences and avoid building fire control lines in or near occurrences. Also, allow fire to creep/back into occurrences from adjacent terrain if the fuel loading permits. Evaluate other activities on a site-by-site basis considering species abundance, population size, geographic distribution, and known species ecology.*
    - MANAGEMENT REQUIREMENTS for Mildred's clarkia. This Sensitive species is an annual with a habitat need for open spaces. When visited in 2021, these occurrences appeared suppressed under vigorous brush. Only one mature plant was found. The management prescription encourages the use of prescribed fire to promote this species but provides no flexibility for applying fire during this annual plant's growth cycle. Therefore, implement treatments only from September through February. Otherwise, no management requirements. – see Appendix A for Controlled Area details.

- **FS Sensitive plant species – project activities – project activities may impact individuals but not likely to cause a trend toward federal listing or loss of viability.**
  
- **Northern Sierra daisy** (*Erigeron petrophilus* var. *sierrensis*; **ERPES2** – PNF Watch List species).
  - Northern Sierra daisy is known from a large rambling occurrence near the southwest margin of phases 1 and 2 in T23N R04E S36 and T23N R05E S31. This occurrence totals about 42.7 acres (20.36 of which is within the project area) and overlaps with most of the other rare species analyzed here because it is on the Rim Rd serpentine belt. Habitat for this species is always in serpentine or at least weakly ultramafic openings with minimal to spotty tree canopy, often also in openings with an open shrub layer dominated by white-leaf manzanita (*Arctostaphylos viscida* and/or *Arctostaphylos mewukka*).
  - This species can be recognized year-round.
  - PNF Management Prescription for this species (USDA Forest Service 2014) says to:
 

*Evaluate all project activities on a site-by-site basis considering species abundance, population size, geographic distribution, and known species ecology.*
  - MANAGEMENT REQUIREMENTS for Northern Sierra daisy. It's often not practical to flag occurrences of this species because there are few woody plants to hang plants on and the ground is sometimes hard rock that won't accept pin flags. Therefore, to avoid disturbance to the species, do not masticate within BCAs (see map). Lop and scatter by hand OK, with worker training. No manual ignitions in serpentine area/BCA (train crews to visually identify serpentine areas) – this requirement is probably unnecessary because fuels are naturally so sparse in serpentine, it's unlikely crews would try to ignite there. Do not graze the serpentine (open reddish area) below Rim Rd. See Appendix A for details.
  
- **Ahart's buckwheat** (*Eriogonum umbellatum* var. *ahartii*; **ERUMA6** – FS Sensitive species).
  - Two distinct scattered occurrences are within the project area, totaling about 5.9 acres. Additionally, within 2 miles of the project area, another 9 occurrences or sub-occurrences cover a combined 20.82 acres. Habitat for this species is always on serpentine rock outcroppings, usually on steep and rapidly decomposing exposed ultramafic rock seams.
  - This species can be recognized year-round with training.
  - PNF Management Prescription for this species (USDA Forest Service 2014) says to:
 

*Protect all plant occurrences from ground disturbance. Hand thin and lop and scatter around known occurrences if fuel treatment prior to burning is needed. Investigate the use of prescribed fire as a management tool and monitor effects. To the extent possible, avoid ignitions within occurrences and avoid building fire control lines in or near occurrences. Also, allow fire to creep/back into occurrences from adjacent terrain if the fuel loading permits. Evaluate other activities on a site-by-site basis considering species abundance, population size, geographic distribution, and known species ecology.*
  - MANAGEMENT REQUIREMENTS for Ahart's buckwheat. No manual ignitions in serpentine area (train crews to visually identify serpentine areas) – this requirement is probably unnecessary because fuels are naturally so sparse in serpentine, it's unlikely crews would try to ignite there. Lop and scatter by hand OK, with worker training, although fuel loading is so sparse in ERUMA6 habitat that lop-and-scatter should be unnecessary. Do not graze the serpentine belts/BCAs (either the one below Rim Rd or the one above Pulga cutting across the S-facing slope of Flea Valley and down to Camp Ck Rd.) – See Appendix A for details.

- **FS Sensitive plant species – will not affect:** With management requirements incorporated, 100% of plants will be protected.
- **Lewis Rose’s ragwort** (*Packera eurycephala* var. *lewisrosei*; **PAEUL** – FS Sensitive species).
  - Lewis Rose’s ragwort is known from several occurrences on the southeastern side of phases 1 and 2, as well as an occurrence scattered across the Federal lands portion of Phase 3. There is a total of about 52 acres of Lewis Rose’s ragwort inside the project area. Additionally, within 2 miles of the project area, a total of 20 occurrences or sub-occurrences cover a combined additional 700 acres. Habitat for this species is always in rocky serpentine to mildly ultramafic openings with only minimal tree canopy. This species can grow in less ultramafic areas than most serpentine endemics can tolerate, but 75% or more of the individuals are on strong serpentine. Therefore, if the taxon’s core occurrences on serpentine are protected, then 75% of the total plants in the project area will be protected.
  - This species can be recognized year-round even by non-botanists.
  - PNF Management Prescription for this species (USDA Forest Service 2014) says to:
 

*Protect at least 75% all known plant occurrences within a project area from ground disturbance. Investigate the use of prescribed fire as a management tool and monitor effects. Develop monitoring plans to evaluate fire effects on individuals and populations before prescribed burning operations. To the extent possible, avoid ignitions within occurrences and avoid building fire control lines in or near occurrences. Also, allow fire to creep/back into occurrences from adjacent terrain if the fuel loading permits. Hand thin, lop and scatter around known occurrences if fuel treatment prior to burning is needed. Avoid building landings and temporary roads through known occurrences. Avoid sub-soiling through known occurrences. Avoid machine piling within known occurrences. If other resource issues necessitate pile burning, work with the District Botanist to avoid placing piles on individual plants within the occurrence to the degree feasible. Evaluate other activities on a site-by-site basis considering species abundance, population size, geographic distribution, and known species ecology.*
  - MANAGEMENT REQUIREMENTS for Lewis Rose’s ragwort. It’s not practical to flag every occurrence of this species because woody plants to hang flags on are not always present, and some occurrences are on rock where pin flags cannot be inserted. However, the roadside occurrences can be flagged at least as to start and end so masticators can be kept out of Lewis Rose’s ragwort occurrences. No manual ignitions in serpentine area (train crews to visually identify serpentine areas) – this requirement is probably unnecessary because fuels are naturally so sparse in serpentine, it’s unlikely crews would try to ignite there. Avoid masticating within occurrences of Lewis’ ragwort (if flagging is not practical, use georeferenced maps to keep masticators off occurrences). Develop a monitoring plan for ALJE & PAEUL before initiating first burn, and implement it (monitoring costs to be part of the implementation budget). If pile-burning in a BCA, require District Botanist or a contracted botanist to help crews site piles off of rare plants. See Appendix A for Controlled Area details.
  - **FS Sensitive plant species – project activities may impact individuals but not likely to cause a trend toward federal listing or loss of viability:** An adequate percentage of Lewis Rose’s ragwort plants would be protected by observing management requirements. See Appendix A for Controlled Area details.



- **Olive phaeocollybia** (*Phaeocollybia olivacea*; **PHOL** – FS Sensitive species).
  - Olive phaeocollybia has 562 acres of high-quality potential habitat modelled in the project area. Additionally, within 2 miles of the project area, there appear to be more than two thousand additional acres of high-quality potential habitat. Habitat for this species is mature Douglas fir forests with a strong hardwood component. It is unclear how the species' habitat viability is affected when virtually all Douglas fir trees in an area are killed by fire at the same time, as has occurred across virtually the entire project area. The only surviving Douglas fir trees seen were
    - (1) fewer than half a dozen in interior of Phase 2 on the Pulga serpentine belt near the western edge of T23N R05E Sn 32;
    - (2) also in Phase 2, along the northern border of the phase, following the crest of the ridge that divides Flea Creek from Dogwood Creek drainages. Here, isolated groups of mature Douglas fir growing with mature black oak were seen surviving. These account for 15-30 Douglas fir trees;
    - (3) in Phase 2, subunits 8a and 7a and the highest-elevation northern part of 5a subunit, which did not burn (but are not modeled as high-quality PHOL habitat either).
  - This species can be identified, with training, during a narrow fruiting window in winter, so it is seldom surveyed for (hence the reliance on modeling).
  - PNF Management Prescription for this species (USDA Forest Service 2014) says to:
 

*Protect all occurrences from ground disturbing activities that would result in soil displacement.*
  - **MANAGEMENT REQUIREMENTS** for olive phaeocollybia. Protecting all 562 acres of modeled high-quality habitat from ground disturbance would preclude mastication on some of the areas that would most benefit from it because they are most invaded by non-native blackberry and very dense brush. Furthermore, such a requirement would preclude building some needed handlines. (To be effective, handlines need to be placed in specific locations, dictated by topography.) Prohibiting handlines through high-quality modeled habitat would defeat the project purpose of creating pyrodiversity by burning different areas at different times. Furthermore, prohibiting ground disturbance would do little to restore the high-quality habitat this species once had. However, PHOL would continue to have abundant high-quality habitat nearby, at adjacent slightly higher-elevation lands. Therefore, it is proposed that near roads and along necessary handline corridors, ground disturbance be accepted even in modeled high-quality habitat for this species. If mastication is performed 100' off roads and handlines are 5' wide, GIS analysis based on expected handline location as of June 29, 2021 shows that ground disturbance would intersect with modeled high-quality PHOL habitat on about 9.8 acres, or 1.7% of the total acres of modeled high-quality habitat. No management requirements are recommended.
- **FS Sensitive fungal species – project activities may impact individuals but not likely to cause a trend toward federal listing or loss of viability:**
  - An adequate 98.3 % of modeled high-quality habitat acres are protected. There are no known occurrences in the project area.
- **Elderberry** (*Sambucus nigra* – Common species that may support rare beetle, now or in the future.)
  - Elderberry was not GPSed during surveys because it is common. However, it was noted to be present in virtually every phase and subunit (except 8a and 7a). Elderberry is not a rare plant but it is usually protected during treatment activities in the Valley and Sierra foothill zones because it is the only host for a federally threatened invertebrate, the Valley Elderberry Longhorn Beetle.

The Concow Pyrodiversity project area is not within designated critical habitat for the VELB. VELB is seldom found above 500' in elevation, but this is possible, and it would be expected to be increasingly likely as climate change progresses.

- This tree species can be identified year-round.
- The USFWS has produced detailed guidelines for assessing the likelihood of VELB occupancy in a stand of elder and for avoiding impacts to the VELB during various project activities (USFWS 2017). The wildlife biologist(s) will, at their discretion, add management requirements designed to protect the VELB based on their professional judgement about whether VELB occurs or would be likely to occur within the area within the next 40 years.
- MANAGEMENT REQUIREMENTS for elderberry. Generally, it would be recommended to train crews to recognize elderberry, to not cut any elderberry stem greater than 1" diameter, to trim only between November and February when in VELB habitat, and to avoid trenching or cutting fireline within 20 feet of an elder shrub. Also, it would be preferable to implement prescribed fire between September-February. These recommendations from a botanist are not binding because this is a wildlife, not a botany, conservation issue. See Appendix A.
- **Long-fruited jewelflower** (*Streptanthus longisiliquus* – **STLO7**, PNF Watch List species).
  - Long-fruited jewelflower is known from one occurrence near the southeastern corner of Phase 1 in Section 14, totaling about 0.68 acres. This is the only occurrence within 2 miles of the project area, and the part of this occurrence that is outside the project area only includes about another 0.4 acres.
  - This species can be recognized about May through July. It is a short-lived perennial which is usually dormant, and thus not vulnerable to impacts from treatment, between about September and March.
  - PNF Management Prescription for this species (USDA Forest Service 2014) says to:  
*Evaluate all project activities on a site-by-site basis considering species abundance, population size, geographic distribution, and known species ecology.*
  - MANAGEMENT REQUIREMENTS for long-fruited jewelflower. This species co-occurs with the other serpentine endemic species immediately below Rim Rd. No additional requirements beyond those listed above for ALJE, ERPES2, PAEUL, etc. are necessary. See Appendix A for details.

*Species of conservation concern (rare plants) summary:*

- *There are no concerns for species of conservation concern (FS Sensitive or PNF Watch List species) with implementation of the Management Requirements that are built into the project design (see Appendix A).*

## **NON-NATIVE INVASIVE PLANTS (NNIP)**

Five species of NNIP are known from within this project area. See Table 2. See Appendix A, Management Requirements, for measures to prevent the spread of these species, and to pull them when time and funding allows.

Table 2. Acres of NNIP found within the project area.

Species	CDFA category <sup>1</sup>	Acres	Comments about distribution within project area
purple false brome ( <i>Brachypodium distachyon</i> )	None	12.8	Concentrated in the easternmost powerlines corridor that traverses eastern edge of Phase 2. Is naturalizing outside the powerline corridor. Population is likely more extensive than mapped (BRDI2_002).
yellow star-thistle ( <i>Centaurea solstitialis</i> )	CCR 4500	10.3	2 multipart occurrences (CESO3_190 and _345) scattered across mostly N half of Phases 1 and 2, esp. near roads. Population is likely more extensive
bull thistle ( <i>Cirsium vulgare</i> )	CCR 4500	24.8	2 scattered, multipart occurrences (CIVU_017 and 018) strewn across phases 1 and 2. Population is likely more extensive
Scotch broom ( <i>Cytisus scoparius</i> )	CCR 4500	0.79	One tight sub-acre occurrence (CYSC4_222) in Phase 3 on the saddle that marks the transition from south-facing to north-facing slopes.
Himalayan blackberry ( <i>Rubus armeniacus</i> )	None	127.3	A codominant to dominant shrub in parts of the project area, especially almost all stream drainages and seepy areas. Population was mapped conservatively (RUAR9_0544) and is definitely much more extensive.

<sup>1</sup> The California Department of Food and Agriculture's noxious weed list (CDFA 2021a) divides noxious weeds into categories A, B, C, and CCR 4500 (CDFA 2021b). A-listed weeds are those which are not yet or are barely established in California, thus eradication or containment is considered feasible and is required at the state or county level; B-listed weeds are those where eradication or containment is at the discretion of the County Agricultural Commissioner; and C-listed weeds are generally widespread and require eradication or containment only when found in a nursery or at the discretion of the County Agricultural Commissioner. CCR 4500 weeds are statutorily defined as noxious within the meaning of Section 5004 of the Food and Agricultural Code. However, additional weeds can still be declared "weed pests" even without amendment CCR 4500.

- **Purple false brome (*Brachypodium distachyon*); BRDI2**
  - There is a large and well-established infestation of BRDI2 in the eastern of the two high-voltage powerline corridors that traverse Phase 1. BRDI1 shares this disturbed habitat with several other non-native annual grasses that were not mapped because they are not NNIP. While most of the rest of the survey area appears relatively resistant to invasion by annual grasses so far, BRDI2 has already invaded upslope a considerable distance away from the powerlines corridor. In the foreseeable future, increasing fire frequency could give annual grasses a competitive advantage against shrubs and perennials. Therefore, care needs to be taken to not spread this weed into project units – see the Management Requirements table in Appendix A for prevention measures.



- Purple false brome is an annual grass in the tribe Festuceae. It generally grows in sunny sites and can spread rapidly through pastures, borders of forests, and roadsides. In California, purple false brome can be found on the coastal range from Mendocino County south to Meixco, and in the Sierran foothills from Tehama County south to Mariposa County. It reduces habitat for native species and may contribute to a more flashy, sheetlike grassland fire regime compared to the patchier fire regime promoted by perennial bunchgrasses.
- **Yellow star-thistle (*Centaurea solstitialis*).**
  - Yellow star-thistle is known from several sites within the project area. Numerous small to large new infestations were identified during surveys. The occurrences are almost certainly more extensive, given the impossibility of an exhaustive survey in that terrain, and all roads and former roads should be regarded as likely CESO3 sites.
  - Yellow star-thistle is an annual species in the sunflower family. Plants start out as rosettes of basal leaves in the winter, and in the late spring and through the summer they send up a many-branched stem 3 to 4 or more feet tall, with spiny flower heads at the tip of each branch. This species propagates rapidly by seed, and a large plant can produce nearly 75,000 seeds. Yellow star-thistle has invaded 12 million acres in California, where it inhabits open hills, grasslands, open woodlands, fields, roadsides, and rangelands, and it is considered one of the most serious rangeland weeds in the state. It is a serious nuisance on recreational lands, degrades the value of private property, range and timber lands, is toxic to horses, and poses a major threat to biodiversity in native ecosystems (CDFA 2019a). However, yellow star-thistle is not yet widespread in the Sierra Nevada, and an active multi-agency program is in place to locate and eliminate occurrences as they creep up into the mountains (e.g. the Yellow Starthistle Leading Edge Project). Although seeds can survive up to 10 years in the field, few seeds survive beyond three or four years; thus an infestation of yellow star-thistle can often be eliminated with three years of preventing seed set (DiTomaso et al. 2013). Pulling is usually effective in controlling this species except where growing in hard-compacted ground where plants may break off at the base and resprout. Yellow star-thistle is still uncommon on the Feather River RD, and its spread is actively discouraged by pulling plants whenever possible.
- **Bull thistle (*Cirsium vulgare*).**
  - Bull thistle is uncommon but widespread across Phases 1 and 2. Numerous small to large new infestations were identified during surveys, and the real extent of bull thistle infestation is likely larger than mapped.
  - Bull thistle is a perennial species in the sunflower family. Although it is classified as a perennial, it grows as quickly as most annuals and benefits from disturbance such as increasing fire frequency. Plants start out as rosettes of basal leaves in the winter, and in the late spring and through the summer they send up a many-branched stem 3 to 4 or more feet tall, with spiny flower heads at the tip of each branch. These spiny flower heads grow to the size of a golf ball or even a tennis ball, and can break off and tumble downhill, spreading seeds a considerable distance. This thistle is extremely widespread in California and is found virtually everywhere except in the desert. In the survey area, it tended to be found on the most productive sites (i.e., spots where slopes were relatively gentle, soils appeared relatively deep, and the standing dead trees were particularly large).
- **Scotch broom (*Cytisus scoparius*).**
  - Scotch broom is widespread across the northern Sierra Nevada but remains relatively uncommon on most of the Feather River Ranger District. One new infestation was identified

during surveys. Although it has already gone to seed for at least one season, it does not appear to have spread very far and this infestation could be abated with one day of volunteer labor from a crew of two or three.

- Scotch broom is a perennial species in the legume family. Although it is classified as a perennial, it grows as quickly as some annuals and benefits from disturbance such as increasing fire frequency. Plants do not keep their leaves for long and are sometimes mistaken for plants such as ephedra because of their leafless appearance. The dark green stemmy plants can grow about head-high and produce abundant bright yellow flowers in spring, which mature into slightly fuzzy pea-like pods which age from yellow to blackish. The dark, hard seeds resemble large lentils. Because this hard seed can persist in the soil for 80 years and is stimulated by fire, Scotch broom infestations are difficult to exterminate even if every living individual is pulled for several years running.
- **Himalayan blackberry (*Rubus armeniacus*).**
  - Invasive blackberry is uncommon but widespread across Phases 1 and 2. Numerous small to large new infestations were identified during surveys, and the real extent of bull thistle infestation is likely larger than mapped.
  - Invasive blackberry is a long-lived perennial that prefers to propagate clonally and is stimulated by fire. A single individual can cover many hundreds of square feet. Dense infestations make foot travel very difficult, painful, and dangerous. The plant flowers annually from April through June and is visited by numerous pollinators, especially honeybees. Although the large black berries are edible to humans and wildlife, invasive *Rubus* thickets are not particularly good bird or pollinator habitat (compared to, for example, diverse native brush species with some openings). Compared to native vegetation, they likely decrease wildlife habitat overall. This invasive vine is extremely widespread in California and is found virtually everywhere except in the desert. In the survey area, it was almost ubiquitous (even occasionally found on serpentine) but was most dominant in drainages, where it was often the most significant contributor to plant biomass. Non-native blackberry invasion has serious consequences for biodiversity because non-native blackberry can easily smother native vines and riparian flora, such as pipevine, native *Rubus* (e.g., *R. leucodermis*), *Aquilegia*, *Heuchera*, *Erythranthe* spp., etc. This simplification of riparian flora has the usual cascading undesirable effects (e.g., loss of pollinator diversity).

Management Requirements for the Concow Pyrodiversity Project are designed to prevent the spread of all NNIP into new areas and to continue treatments intending to slowly reduce the overall infestations (see Appendix A).

*Non-native invasive plants (NNIP) summary:*

- *Concerns about NNIP in the project area are being addressed as part of project design with an integrated pest management program that meets the purpose and need for the project (see Appendix A and following Noxious Weed Risk Assessment).*

## Noxious Weed Risk Assessment

The Record of Decision (ROD) for the SNFPA amends the management direction in the LRMP for the Plumas National Forest to address management of noxious weeds and invasive species. The noxious weed management standards and guidelines state that a noxious weed risk assessment needs to be conducted to determine the risks for weed spread associated with different types of proposed management activities. Noxious Weed Risk Assessment. A Noxious Weed Risk Assessment, focusing on California Department of Food and Agriculture (CDFA) listed noxious weeds, is prepared to evaluate the risk of noxious weed introduction and spread as a result of project activities. The evaluation is a nine-step process. The nine factors are listed and evaluated in the following table.

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Factors	Variation	Risk
<b>NON- PROPOSED ACTION DEPENDENT FACTORS</b>		
1. Inventory	Adequate – area has been adequately and recently surveyed for NNIP	Low risk
2. Known Noxious Weeds	Pervasive infestation by invasive blackberry. Large infestation of purple false brome confined to powerlines grassland area of project. Scattered infestations of yellow star thistle and bull thistle. One isolated infestation of Scotch broom. Project area varies from extremely dominated by NNIP (esp. streams) to virtually NNIP-free (ridge areas), resulting in an overall assessment of moderate risk.	Moderate risk
3. Habitat vulnerability	Levels of disturbance in the project area are stable since the Camp Fire, with regular disturbance confined to road corridors and powerlines. NNIP populations are self-sustaining but native plant populations have also regrown and are holding them in equilibrium.	Moderate risk
4. Non-project dependent vectors	Well-used public roads and powerlines are already in project area; birds and other wildlife readily spread seed esp. of invasive blackberry	Moderate risk
<b>PROPOSED PROJECT DEPENDENT FACTORS</b>		
5. Habitat alteration expected as a result of project	Periodic reduction in shrub canopy and understory/surface fuels through fire and grazing	Moderate risk, which is mitigated by project design prevention and control measures
6. Increased vectors as a result of project implementation	Grazing; introduction of heavy equipment esp. along road corridors; limited ground disturbance through construction of hand firelines	Moderate risk, which is mitigated by project design prevention and control measures
7. Control and prevention measures	Prevention measures and control measures in project design	Low risk results from prevention and control measures
8. Anticipated weed response to proposed action	Project design features include elimination of noxious weeds, prevention and monitoring	Low risk results from prevention and control measures, and lack of pre-existing noxious weeds



Factors	Variation	Risk
9. Cost estimate	Cost of control is not large as a fraction of cost of project	Low risk

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Conclusion: ***With implementation of project design features to prevent introduction of noxious weeds into the project area and prevent their spread, there is an overall MODERATE POTENTIAL for further weed spread that would result from overall project implementation.***

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(Note: While not cited in the BE, the above 2 sources were consulted during PHOL analysis to understand Douglas-firs (and hence, PHOL's) range dynamics under a likely climate change scenario. It was learned that by the end of the twenty-first century 3500'-elevation Butte County lands will still be within, although at the very edge of, Douglas-firs' range.)

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**APPENDIX A**  
**BOTANY Management Requirements for the Concow Pyrodiversity Project.**

Potential Resource(s) Affected	Management Requirements Designed to Reduce or Prevent Adverse Effects	Responsible Person(s)
Rare Plants - Conservation	BOTANY CONTROLLED AREAs (CAs) have been established: (1) along southern boundary of Phases 1-2 below Rim Rd, starting at a point 0.4 miles SW of Concow Rd and continuing to the end of the project; (2) on serpentine (visibly bare strip of land slicing east-west across north part of Phases 1 and 2, north of Flea Creek). NO HEAVY EQUIPMENT (e.g. mastication) or manual ignitions or grazing allowed within this botany CA. Backing fire and hand-cut-and-pile/lop-and-scatter OK. Manual treatment crew should be trained to avoid rare plants. See map. A shapefile of these BCAs accompanies this report.	Botanist, Project Implementation Teams, Contract Administrators
Rare Plants - Conservation	BOTANY CONTROLLED AREA (3) has been established in northeastern portion of Phase 2 to protect Mildred's Clarkia. NO HEAVY EQUIPMENT (e.g. mastication) or fire or grazing allowed within this botany CA except from September 1 to February 28. Manual treatment crew should be trained to avoid rare plants if working between March 1 and August 31. See map. A shapefile of these BCAs accompanies this report.	Botanist, Project Implementation Teams, Contract Administrators
Rare Plants - Conservation	It is encouraged to implement burns and grazing from September through February to maximize beneficial effects on rare and native plant communities.	Project Implementation Teams, Contract Administrators
Rare Plants - Conservation	If conducting lop-and-scatter or hand-cut-and-pile activities inside Botany CAs, have a qualified botanist lead a training for crews on recognizing and avoiding the rare shrubs (PAEUL, ERPES2, ERUMA6).	Botanist, Project Implementation Teams, Contract Administrators
Rare Plants - Conservation	Grazing animals should be moved frequently (e.g. every 3 days)	
Rare Plants – Conservation; Ecology	Do not burn or graze the same area several <b>springs</b> in a row, except targeted NNIP reduction (e.g., yellow star thistle reduction) treatments.	
Rare Plants - Conservation	District Botanist or delegate must be notified before project implementation begins so BOTANY CONTROLLED AREAS can be flagged. Flagging can be one of the following: (1) Indicated on the ground by red-and-black-stripe and blue-and-black-stripe flagging always tied together. (2) Indicated on georeferenced maps (e.g., Avenza) that accompany crews into the field on phones or tablets, <i>if this method will be equally or more effective compared to physical flagging.</i>	Botanist, Implementation Team, and Contract Administrator
Elderberry-Conservation	<b>Recommendations only:</b> Train crews to recognize elderberry and not cut any elderberry stem greater than 1" diameter. <b>If wildlife biologist determines VELB habitat:</b> Trim only between November and February, avoid cutting fireline w/in 20' of shrub. Prefer to implement prescribed fire Sept-Feb.	Wildlife biologist to work with Implementation Team and Contract Administrator
Non-Native Invas-	Ensure that all plant material and fill material used for erosion	Botanist, Implement-

Potential Resource(s) Affected	Management Requirements Designed to Reduce or Prevent Adverse Effects	Responsible Person(s)
ive Plants (NNIP) - Prevention	control and/or road maintenance is free of NNIP, including straw, mulch, gravel, and rock ( <i>certified weed-free</i> ).	ation Team, Contract Administrator
Non-Native Invasive Plants (NNIP) - Prevention	Clean all off-road equipment entering the project area if it may be coming from areas infested with nonnative invasive plants (NNIP).	Botanist, Fuels Officer, Project Implementation Teams, Contract Administrators
Non-native Invasive Plants (NNIP) - Prevention	<p>To the greatest extent feasible keep all equipment, vehicles, and supplies out of areas of known NNIP infestations, including any NNIP infestations along access routes and new infestations that may be discovered during project implementation. NNIP infestations may sometimes be flagged with bright orange “noxious weed” flagging. However, they will instead be mapped on georeferenced maps (e.g., Avenza) that accompany crews into the field on phones or tablets, <i>if this method will be equally or more effective compared to physical flagging</i>.</p> <ul style="list-style-type: none"> <li>Any equipment, vehicles, and supplies that do come in contact with NNIP infestations (plants or the ground close to them) during project implementation should be thoroughly cleaned of dirt, mud, and plant debris before entering any un-infested project area.</li> <li>Hand cutting of broom plants and placement of burn piles on top of NNIP infestations is encouraged.</li> <li>New infestations should be mapped and reported to the District Botanist.</li> </ul>	Botanist, Fuels Officer, Project Implementation Teams, Contract Administrators
Non-native Invasive Plants (NNIP) - Prevention	<p>Members of the project implementation teams (layout crew, contract administrator, etc.) should watch for and be able to recognize NNIP.</p> <ul style="list-style-type: none"> <li>As time allows, pull some or all of NNIP encountered during project activities (avoiding archaeology controlled areas).</li> <li>New infestations should be mapped and reported to the District Botanist, flagged and avoided, and pulled/treated as much as possible.</li> </ul>	Botanist, Project Implementation Teams, Contract Administrators
Non-native Invasive Plants (NNIP) - Prevention	<p>Monitor areas of project related ground disturbance (e.g. skid trails, temp roads, landings, trails, etc.) for NNIP for up to 10 years following project implementation.</p> <ul style="list-style-type: none"> <li>As funding becomes available, new and old infestations of NNIP should be pulled or otherwise treated.</li> <li>New infestations should be mapped and reported to the District Botanist.</li> </ul>	Botanist and Implementation Team
Non-native Invasive Plants (NNIP) - Reduction	Consider developing a program of integrated pest management that includes the use of herbicides to greatly increase control of <i>Rubus armeniacus</i> within the project area.	
Non-native Invasive Plants (NNIP) - Prevention	If the fire return interval in the project area becomes shorter, this would be expected to shift the vegetation community toward more graminoids and fewer shrubs. Monitor species composition and adjust FRI as needed to promote native graminoids and tree establishment while minimizing further invasion by invasive grasses.	



